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Ohr, Dieter

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PURCHASING HEALTHY FOOD IN GERMANY. AN EMPIRICAL ANALYSIS OF ITS ATTITUDINAL AND SOCIO-ECONOMIC ANTECEDENTS

Dieter Ohr

In diesem Beitrag wird der Kauf gesunder Nahrungsmittel untersucht und geprüft, welchen Einfluß dabei ernährungsbezogene Einstellungen einerseits, sozioökonomische Merkmale andererseits auf das Kaufverhalten ausüben. Datengrundlage der empirischen Analysen sind zwei Stichproben deutscher Haushalte ($n_1=4426$, $n_2=4638$). Es zeigt sich, daß Haushalte, in denen gesunde Ernährung auf der Einstellungsebene bedeutsam ist, auch tatsächlich signifikant mehr gesunde Nahrungsmittel kaufen. Neben dem Einfluß ernährungsbezogener Einstellungen lassen sich auch einige interessante sozioökonomische Differenzierungen nachweisen. So werden mehr gesunde Nahrungsmittel konsumiert bei höherer Bildung, niedrigerem Lebensalter, wenn kleine Kinder im Haushalt leben und in westdeutschen Haushalten, vergleicht man diese mit ostdeutschen Haushalten.

This paper examines the purchase of healthy food in Germany, in particular the influence which two classes of determinants may exert, that is attitudes concerning nutrition and socio-economic characteristics. The empirical analyses are based on two samples of German households ($n_1=4426$, $n_2=4638$). It is shown that attitudes regarding the health aspect of nutrition do in fact exert a significant influence on the purchase of healthy food. Households where beliefs and preferences favoring a healthy nutrition predominate are also more likely to purchase healthy food products. In addition to nutritional attitudes, socio-economic differences play also a role in explaining the decision to buy healthy food. Its purchase is more likely with higher education, lower age, when small children are living in the household, and, for households in West-Germany in comparison to East-Germany.

1. Why Consumers Choose Healthy Food: Arguments and Research Hypotheses¹

During the last decades the general public has become more sensitive with respect to its food. Several food scandals, for instance pollution or even toxic substances in food articles, set the stage for a still growing consciousness that there might be a close link between nutrition and health. More recently, the so-called 'mad cow disease' marked another culmination point in a long chain of food scandals. To be sure, an increasing number of media reports on food scandals does not necessarily mean that the quality of food currently is in fact worse than three or four decades ago. Rather, a growing number of reported food scandals may in part also be due to the fact that the media system has changed substantially during the last decades and competition has increased. But whether or not the greater awareness of consumers concerning healthy nutrition is based on an accurate perception of real-world developments, the increase in public sensitiveness can hardly be disputed and will most certainly affect consumer behavior.

There is another important reason why the link between health and nutrition could have become more prevalent in public debates and in the consumers' minds. Quite apart from food scandals we have observed a long-term secular development towards a higher well-being of the western, industrialized societies. As in the course of this process the economic situation of most citizens in the developed societies has improved, the demands which are put on nutrition have risen because health is, in microeconomic terminology, a superior good. Citizens thus develop clear beliefs and intense preferences on how and what to eat and drink. These beliefs and preferences could, then, in turn be reflected in the citizens' consumer choices. Therefore, beliefs and preferences – in short: attitudes – on nutrition should have a clear and relevant effect on the purchase of food articles. In particular, consumers with intense nutritional attitudes towards a pro health direction should choose healthy food articles to a higher degree than consumers without such attitudes. Whether and to what degree this is in fact the case will be analyzed in this article.

Postulating that attitudes on nutrition have a strong impact on the purchase of healthy food implies that a consumer's choice in the small local shop or the supermarket is at least partly motivated by conscious consideration and the desire to act accordingly. Conversely, the act of purchasing food is neither completely spontaneous and largely based on the momentary mood nor a mere execution of habits without any conscious *involvement* (cf.

¹ For their help in coding the food articles I would like to thank *Stephanie Bous* and *Petra Streitz* as well as *Omer Gersten* for his support in translating the often very specific concepts for the food articles into English.

Kroeber-Riel 1992 for the involvement concept in consumer research). Purchasing food in the literature is rather conceived as behavior with an intermediate degree of involvement and with a certain degree of mental control. Conceiving food purchasing in this way may also imply that long-standing habits are followed if these habits are connected with stable attitudes (Kroeber-Riel 1992: 169).

It is, first, an aim of this article to test and to examine the postulated relationship between nutritional attitudes and the purchase of healthy food articles. Secondly, it will also be investigated in a more exploratory manner which socio-demographic variables are able to account for the purchase of healthy food.

2. Cross-sectional and Panel Approaches to Analyze the Purchase of Healthy Food

A cross-sectional approach is a first, straightforward method to shed some light on the relationship between nutritional attitudes and purchasing healthy food. When using this approach it is assumed that current attitudes on nutrition as well as current socio-economic positions are causally antecedent to food purchase:

$$Y_{i,t} = \beta_0 + \beta_1 \cdot A_{i,t} + \dots + \beta_2 \cdot SE_{i,t} + \dots + \varepsilon_{i,t} \quad (1)$$

In equation (1) $A_{i,t}$ indicates a particular attitude on nutrition at time t , $SE_{i,t}$ stands for a typical variable out of a set of socio-economic variables, and $Y_{i,t}$ represents a measure for the purchase of healthy food.

In many cases it is theoretically as well as empirically promising to include the former level of the dependent variable into the model equation:

$$Y_{i,t} = \beta_0 + \beta_1 \cdot A_{i,t} + \dots + \beta_2 \cdot SE_{i,t} + \dots + \beta_3 \cdot Y_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

The effect of the Y -variable measured at $t-1$ on the same variable at time t can designate how stable purchase behavior is over time. A large effect, for example, might indicate that the behavior is habitualized for the most part. Alternatively, the variable can also be understood as a proxy measure for those determinants of purchase behavior not taken account of in the model. Since most often past behavior is an excellent predictor of behavior

in the future, explained variance in model (2) is likely to be much higher compared to model (1). If nutritional attitudes and socio-economic variables are important predictors for purchase behavior in t both types of variables will also be strongly correlated with purchase behavior in $t-1$. Hence, the effects being estimated for these variables with model (2) will most certainly be much smaller than those in model (1). Which kind of estimates better reflect the 'true' effects is difficult to decide in general and strongly depends on the researcher's theoretical model. It is safe to say, however, that the coefficients for attitudes and socio-economic variables are likely to be somewhat overestimated in model (1) and somewhat underestimated in model (2).

Attitudes on nutrition may change during a time period. These changes may be due to normal maturation in the course of the life-cycle but can also go back to so-called period effects, for example media reports covering the contamination of food products. Attitudinal changes may, then, in turn induce changes in consumer expenditures on food. To test this presumption, one can make use of model (3):

$$\Delta Y_i = \beta_0 + \beta_1 \cdot \Delta A_i + \dots + \beta_2 \cdot \Delta SE_i + \dots + \beta_3 \cdot Y_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

Here, ΔA_i , for example, indicates the attitudinal change from $t-1$ to t . In most applications of model (3) the effect of the lagged endogenous variable, Y_{t-1} , will be negative. This negative effect, then, designates that an already high level of purchases in the preceding period is followed by rather small increases in the following period.

Equation (3) represents the common view which states that, generally, attitudinal changes produce behavioral changes. As far as purchase behavior is concerned, attitude changes regarding nutrition would be causally prior to changes in purchasing food. Yet, the competing hypothesis which postulates just the opposite causal direction is plausible as well: Consumers might change their purchase habits, as a result of TV commercials for instance, and may consequently adjust their attitudes. Seen in this perspective, ΔY_i would be causally antecedent to ΔA_i . Thus, one can plausibly argue for both causal directions.

In principle, each of the three approaches mentioned could be conducted with the *ZUMA datasets of the GfK household and consumer panel 1995* (henceforth in short: GfK data). In practical terms, however, this proves to be difficult at present, since only two different time points of measurement are currently available at the household level: Socio-demographic data were gathered in January 1994 and in January 1995, attitudes on nutrition in October 1994 and October 1995. Data for purchase behavior are available for the whole

year of 1995. In order to work with the longitudinal models (2) or (3) one could, for instance, examine the change in purchase behavior, if any, between the first and the last months in 1995. Following this or a similar procedure would have its drawbacks, however. First, changes in nutritional attitudes during a period of only twelve months are likely to be quite small and can hardly be distinguished from measurement error. Secondly, with an interval as short as one year previous purchase behavior, Y_{t-1} , is very likely to be an almost perfect predictor of current purchase behavior, thus leaving little room for competing explanatory variables. Thirdly, both types of changes, that is changes in purchase behavior and changes in nutritional attitudes, would have some overlap in the time periods. Hence, in causal terms it would be impossible to clarify the intriguing question of whether changes in purchase behavior do in fact follow attitudinal changes or vice versa. As soon as more panel waves and longer time spans between the measurement points are available in the future, it will be fruitful to expand the empirical analyses to models (2) and (3). Given the data constellation presently at hand, it appears to be most sensible to start analyzing the demand of healthy food with an approach which is very similar to a cross-sectional approach such as model (1). It has been possible, though, to make use of the fact that the purchase data and the attitudinal and socio-economic data have been gathered at different time periods. So, in order to measure purchase behavior with respect to healthy food, the time period from *october 1995 to december 1995* was chosen. Therefore, purchase behavior during this period will be accounted for by socio-economic variables which were collected in january 1995 and nutritional attitudes gathered in october 1995.

3. Measuring the Purchase of Healthy Food and its Determinants

To define 'healthy' food and, conversely, food which is regarded as not being healthy is not an easy task. Even scientific evidence on the relationship between health and nutrition does not seem to be conclusive as the sometimes contradictory food recommendations in newspapers and TV magazines give an illustration of. One should not, however, overstate this point. Although nutritional suggestions in the media do not always point into the same direction, the overall picture emerging for the attentive consumer is fairly clear. Broadly speaking, from the perspective of healthy nutrition some quite simple rules on what one ought to eat and drink are available: It seems to be conducive to one's health if the food does not contain too much fat, if it does not include too much sugar, if nutrition is – more or less – wholesome, if not too much alcohol is consumed regularly etc. Despite these commonly accepted rules, it may still appear as somewhat naïve to classify a particular food product as healthy or unhealthy. To be sure, most food articles are not healthy

or unhealthy as such. Fairly often this is rather a matter of degree. And, still more important, it crucially depends on how much is consumed of a given food product: One glass of red wine, for example, may be conducive to one's health, two liters each day most certainly not. While it is often difficult to distinguish between healthy and non-healthy food with respect to a particular food product at a certain point in time, the situation is different for the *aggregate of all food articles* which are consumed *during a longer period*. Here it seems plausible to assume that consumers who are conscious with respect to their nutrition behavior will attempt to increase the share of healthy food in their total food plan.

There is a wide variety of food products in the GfK data sets (see Table A1 in the appendix). In order to classify the various food articles as 'healthy', the 'nutrition rules' mentioned above have been applied among others. First, it has been assumed that it is harmful to one's health if alcohol is consumed to a relevant degree. Therefore, drinks such as beer, wine, or whisky have been classified into the non-healthy category. Secondly, the food articles have been examined according to in how far *sugar* is an important ingredient. Hence, food articles such as cakes or cookies have also been coded as non-healthy. As a third criterion the *fat* content has been employed. When it comes to cheese, for instance, only those types of cheese with a fat content below 45 percent have been considered as being healthy where 45 percent is, approximately, the average value for soft and hard cheese. Fourthly, food articles have not been designated as healthy food when food additives or preservatives could have been part of the product. In addition to these negative selection criteria positive criteria are important as well. Food products which are commonly regarded as belonging to wholesome nutrition, for instance yoghurt, curd, or wholemeal rice, have been put to the healthy category.

To be sure, this classification can be no more than a rough approximation of those classification schemes which supposedly predominate in the general population. Other researchers might arrive at other decisions. On the whole, however, the food articles which have been classified as healthy should represent the picture in the German population reasonably well.

When we speak, henceforth, of food and healthy food an important qualification has to be made. The food articles in the GfK data sets do neither cover the whole range of food in general nor the whole range of healthy food in particular. For example, fresh meat, fish, and vegetables do not belong to the consumer data sets at present. When interpreting the empirical findings below, this constraint has to be taken into account. This said, it should hold nonetheless, however, that consumers with clear beliefs and intense preferences pro healthy nutrition should, *ceteris paribus*, purchase more of those food products which

have been regarded as furthering the health. In Table 1 the food articles which have been classified as healthy are documented.

Table 1: Healthy food in the GfK consumer data

Milk	unprocessed milk, full-cream milk, soy drinks, soured milk,
Poultry	e.g. legs, breast, wing, escalope, but not inwards oder giblets and
Teas	e.g. medicinal tea, green tea, herb fruit tea
Potato products	wholemeal dumpling, wholemeal potato fritter, wholemeal
Fruit juices	fruit juice, nectar juice, vegetable juice
Crispbread	e.g. soy crispbread, sunflower crispbread, wholemeal wheat
Non-alcoholic drinks	e.g. energy drinks
Cheese	(1) soft cheese such as camembert, melted cheese, blue mold
Rusk	e.g. wholemeal rusk, tea rusk, diet rusk
Yoghurt	e.g. natural yoghurt, fruit yoghurt, drink yoghurt, spice yoghurt
Curd, meals of curd	maximum fat content: 20 percent
Meal	wheat flour, wholemeal wheat, wholemeal, rye flour, rye
Mineral water	
Rice	e.g. Basmati, parboiled longseed, broken rice, natural rice,
Cereals	e.g. rolled oats, cereal bar, wheat bran, linseed

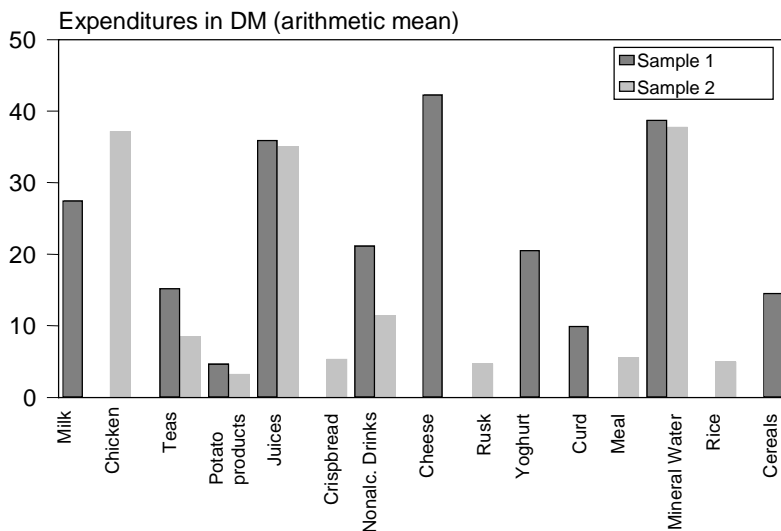
Figure 1 depicts how the expenditures for healthy food are distributed in both GfK samples.² As the food articles in both samples are not the same but overlap only partly, the average expenditures from october to december 1995 are shown for both samples. The dark grey bars represent the expenditures for food groups in sample 1, the lighter grey bars stand for food groups in sample 2.³

When we compare the distribution of healthy food articles between both GfK samples, it appears that sample 1 is somewhat better suited to represent food articles which are commonly regarded as healthy. Food articles such as milk, cheese, yoghurt, and curd are not part of sample 2 but of sample 1. Hence, all in all, food articles which in the public and the media are often declared as an essential part of wholesome nutrition and as being especially conducive to one's health are more likely to be found in sample 1.

² GfK sample 1 contains 4426 households, GfK sample 2 4638 households.

³ Expenditures over a certain time period combine, of course, two aspects. First, they mirror the price which had to be payed for a food article. Secondly, they represent the amount which was purchased during the period. Whereas, for instance, the relatively high expenditure value for cheese is mainly due to the price level for cheese, expenditures for mineral water are largely a function of the amount.

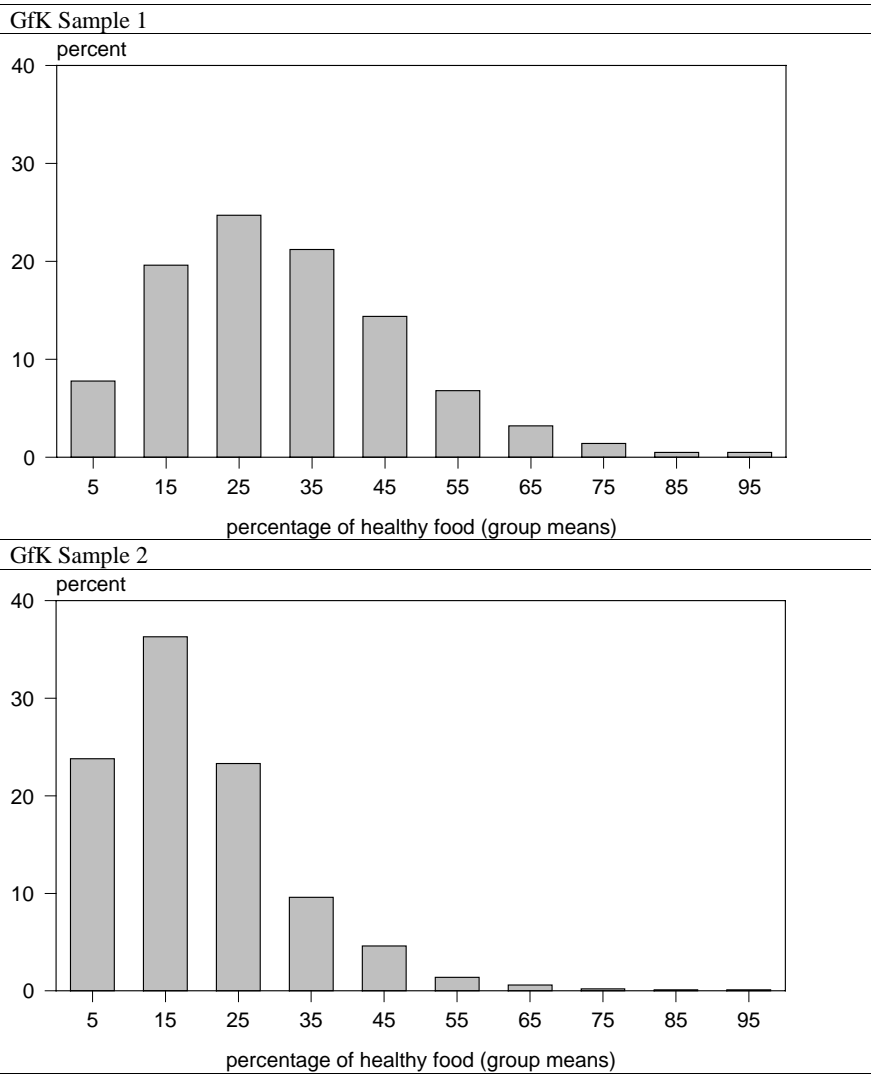
Figure 1: Household Expenditures for Healthy Food



Period: October to December 1995. Data Base: Consumer Data, GfK.

In principle, one could plausibly conceive the *absolute expenditures* for healthy food (in DM) as the explanandum of an empirical analysis. In this case, a household's economic restrictions – for instance its monthly income or household size – would exert a very strong effect on consumer expenditures. Conversely, nutritional attitudes would very likely have only a marginal influence on absolute expenditures. Moreover, according to the notion favored in this article, purchasing food implies the more or less conscious consideration of which kind of food to choose, be it healthy food or food regarded as not so healthy. From this point of view, it seems to be more convincing to look at how important the expenditures for healthy food are *in comparison* to the total food expenditures. Hence, the percentage of expenditures for healthy food with the total expenditures for food as the percentage base will be an adequate measure for nutritional behavior which is motivated by health consciousness. Figure 2 shows histograms for both GfK samples which indicate how the criterion variable of the following empirical analyses, *the percentage of expenditures for healthy food articles with respect to all food articles*, is distributed.

Figure 2: Relative Frequencies for the Percentage of Healthy Food Articles in the GfK Data (Expenditures Healthy Food Articles/Expenditures all Food Articles)



As can be seen in the figure, healthy food is in fact an important component in German households' food plans. Almost half of the households in sample 1, for instance, spend at least 30 percent of their total food expenditures on healthy food. Similar to Figure 1 it is evident here as well that both samples contain fairly different food articles. Whereas the mean percentage for healthy food amounts to 30.6 percent in GfK sample 1, the corresponding percentage equals only 18.9 percent in GfK sample 2.

Let us now come to the potential determinants of the relative expenditures for healthy food. In particular, which kind of *nutritional attitudes* can be expected to determine consumer choices? Certainly, the well-known *principle of correspondence in the level of specificity* does apply here (Fishbein/Ajzen 1975: 369). Therefore, consumer attitudes should affect consumer behavior the greater the more they correspond to the goods involved and the better they specifically refer to the goods in question.

Four attitude scales on nutrition were finally chosen. Although they are not optimally suited in each respect to the consumer data at hand they proved to be adequate overall – in terms of their content as well as in terms of their scale quality. Question wording, Cronbach's α as a measure of scale quality, and the arithmetic means for each item are documented in Table 2.

The four scales represent different aspects of the respondents' beliefs and preferences on nutrition. By means of the first scale, the *preference for healthy food*, an overall high priority of health with respect to one's nutritional behavior is measured. If the food articles documented in Table 1 are in fact perceived as being healthy by the consumers a fairly strong relationship between attitudes and purchase behavior can be expected. Given the fact that fresh food is not an important part in the consumer data at hand, one should not expect huge effects for the *preference for natural food* as well as for the *preference for fresh food*⁴ on purchase behavior. However, both scales measure an interested and positive attitude towards healthy nutrition as the positive correlation between each scale and the preference for healthy food shows (pearson correlation .481 between healthy food preference and natural food preference; .194 between healthy food and fresh food). At least weak effects on the purchase of healthy food should thus be possible nonetheless. The expectation is much more positive for the fourth attitude scale which refers to the *preference for wholesome food*. Here the question wording is almost optimally suited to the food products actually bought. As a wide variety of wholesome food articles is avail-

4 The arithmetic means for the second and third item of the 'fresh food scale' refer to their original values. For the further analyses the items have been recoded into the positive, pro-fresh direction. Computation of Cronbach's alpha is also based on the recoded items.

able in the GfK data sets, the correspondence between attitudes and behavior is quite high. Given this, one should legitimately expect a strong relationship between this particular attitude scale and the percentage of healthy food.

Table 2: *Attitudes on Nutrition*

<i>Preference for healthy food (Cronbach's $\alpha = 0.720$)</i>	Item mean
In my household I eat mild food.	3.1
I pay attention to what I eat and drink because I have to take care of my health.	3.5
I avoid all food that can damage my health.	3.5
<i>Preference for natural food (Cronbach's $\alpha = 0.773$)</i>	
I decline products that have preservatives.	3.3
When buying food, I look for food without additives.	3.5
<i>Preference for fresh food (Cronbach's $\alpha = 0.597$)</i>	
I always buy fresh food instead of, for example, preserved or frozen food.	3.3
Preserved food does taste as good as fresh food.	2.3
I can hardly imagine to cook without prepared foods.	3.0
<i>Preference for wholesome food (Cronbach's $\alpha = 0.682$)</i>	
We live by consuming wholesome foods.	2.5
We eat vegetarian.	1.5
Meals with grain assume a greater and greater part of our total food plan.	2.0
For each item answers from 1 = I strongly disagree to 5 = I strongly agree.	

Number of households: 8406 (GfK sample 1 + GfK sample 2)

The item means in Table 2 clearly demonstrate that health consciousness in Germany with respect to nutrition has reached a fairly high level. Each of the first three items which explicitly stress the health aspect of nutrition is approved by the respondents on the aver-

age. Furthermore, consumers prefer fresh food to preserved food and decline food additives. Of course, both types of preferences can in part also be matters of taste but they reflect as well health considerations. Mixed motives may also exist for the *preference for wholesome food*. To eat vegetarian, for instance, can be ethically inspired (cf. v. Ziehlberg/v. Alvensleben 1998). It also includes a health connotation, however (pearson correlation .387 between healthy food preference and wholesome food preference).

In addition to the nutritional attitudes I expect furthermore some substantive effects of the *socio-economic position* on purchasing healthy food. Choosing between healthy and unhealthy food requires information which is often difficult to obtain. Acquiring and processing the relevant information on nutrition will certainly be the more easier the better one's education and cognitive competence. Therefore, *education* is one of the socio-economic determinants to be examined. Moreover, *generational influences* could have an impact on nutrition practices. Public discussion about nutrition and health has intensified during the last two or three decades. Hence, younger generations should give higher priority to healthy food than older generations if we assume that individuals' attitudes are more moldable during their formative years. It thus appears reasonable to break down the purchase of healthy food according to age. In the cross-sectional design used in this article age automatically indicates the birth cohort as well.

Socialization is again the principal idea behind the distinction between *East- and West-Germany*. Consumers in East-Germany vs. West-Germany have grown up in radically different societies – politically as well as culturally. It can be surmized, then, that their preferences concerning healthy food will differ as well.

For *families with small children* it is expected that they have a greater percentage of healthy food since they are obliged each day to reflect about the best nutrition for their children. Finally, it will also be tested whether *household income* is related to the purchase of healthy food.

In operational terms the socio-demographic variables are defined straightforwardly. Education is measured by means of the main earner's formal school degree. Age is the age in years of the person leading the household. Income represents the overall net household income per month, and, lastly, number of children under 14 years simply reflects the factual numbers.

4. Empirical Findings

Let us at first take a look at the bivariate relationships between the dependent variable, that is the percentage of expenditures for healthy food, and its potential determinants.

Tables 3.1 and 3.2 show the results for sample 1 and sample 2, respectively. To begin with sample 1, strong and significant relationships between all four *attitude scales on nutrition*⁵ and the expenditures for healthy food can be detected. As the Eta-value of .205 shows, the *preference for wholesome food* has by far the strongest relationship with the purchase of healthy food among all four scales.

Table 3.1: *The Purchase of Healthy Food and its Determinants - Bivariate Relationships*

GfK Sample 1

	<i>Percentage of healthy food</i> (arithmetic means)					Eta	p
	1	2	3	4	5		
Nutritional Scales							
Healthy food	28.90	28.11	29.37	32.47	33.94	.123	.000
Natural food	27.37	28.28	28.42	31.49	35.11	.157	.000
Fresh food	24.98	28.39	29.75	32.09	34.43	.125	.000
Wholesome food	27.98	30.11	34.22	38.96	43.22	.205	.000
Education	low	middle	high				
	29.35	30.59	32.28			.079	.000
Age (birth cohort)	19-24	25-34	35-44	45-59	60+		
	35.57	33.54	31.59	28.96	30.02	.100	.000
Children under 14	no	yes					
	29.98	32.91				.074	.000
Income (DM)	-1000	1000-1999	2000-2999	3000-3999	4000+		
	31.99	30.23	29.38	31.05	31.84	.059	.005
East- vs. West-Germany	east	west					
	26.70	31.65				.120	.000

⁵ The attitude scales on nutrition were built as the arithmetic means of the items which belong to the respective concept. For the bivariate analyses (Tables 3.1 and 3.2) digits after the decimal point have been rounded for the attitude scales in order to get whole digit values.

Table 3.2: *The Purchase of Healthy Food and its Determinants - Bivariate Relationships*

GfK Sample 2

	Percentage of healthy food (arithmetic means)					Eta	p
Nutritional Scales	1	2	3	4	5		
Healthy food	15.48	17.99	19.02	19.17	19.97	.064	.001
Natural food	17.01	17.09	18.43	18.77	21.25	.104	.000
Fresh food	18.02	17.06	17.63	20.42	22.13	.141	.000
Wholesome food	17.89	18.54	20.95	21.04	23.21	.100	.000
Education	low	middle	high				
	18.61	18.85	19.36			.026	.207
Age (birth cohort)	19-24	25-34	35-44	45-59	60+		
	20.22	20.18	19.67	18.74	18.09	.062	.001
Children under 14	no	yes					
	18.37	20.80				.081	.000
Income (DM)	-1000	1000- 1999	2000- 2999	3000- 3999	4000+		
	17.28	17.62	18.92	19.47	19.44	.056	.006
East- vs. West- Germany	east	west					
	16.27	19.61				.105	.000

Therefore, beliefs and preferences on nutrition appear to play an important role when it comes to explaining the purchase of healthy food.

Regarding the socio-economic variables, *education* and *age* are both related to the percentage of healthy food as has been hypothesized. With higher education the tendency to choose healthy food rises. Conversely, higher age groups, that is birth cohorts which did not experience the intense public debates on nutrition and health during their formative years, purchase somewhat less healthy food than younger age groups. As was expected, *households with children under 14* buy more healthy food than households without or with older children. As far as the monthly *income* is concerned, group differences are statistically significant. However, the Eta-value is small (.059) and the arithmetic means for the percentage of healthy food do not increase – or decrease – monotonically with

income. Therefore, an interpretation for the relationship between income and healthy food seems to be difficult.

There is, finally, a clear and marked divide between the former communist *East-Germany* and the *West-German Länder*. Households in East-Germany significantly purchase much less healthy food products than their western counterparts. The difference adds up to five percentage points which can be called a fairly large effect. One might speculate that the Eastern part of Germany is still – five years after the German unification at the time when the GfK surveys were conducted – more traditional in a cultural sense. Another interpretation which does not contradict the first one refers to the lower consumption experience of the East-German population. If we take together the effect of age (or birth cohort) and the difference between East- and West-Germany we get some indications that socialization could in fact be an important mechanism in explaining nutritional preferences.

For sample 2 (Table 3.2) the overall pattern of the relationships is fairly similar to sample 1. The associations are lower, however. Probably the main reason can be found in the different composition of both GfK samples regarding the food products.⁶ As already mentioned, GfK sample 1 is more representative of food commonly regarded as healthy in general and wholesome in particular.

In the last step of the analysis a multivariate model for the percentage of healthy food is estimated for GfK sample 1.⁷ Since the dependent variable's measurement level is clearly metric, a linear regression approach is the suitable method. In addition to the determinants in Tables 3.1 and 3.2, two further potential explanatory variables have been included, household size and the product price paid for healthy food.⁸ Together with household

⁶ As the items which measure the preference for wholesome food include an indicator for eating vegetarian, it is, of course, not optimal to construct the percentage of healthy food for GfK sample 2 with poultry as an element (see Figure 1). However, the relationship is only marginally influenced by the expenditures for poultry. If it is excluded from the calculation of the percentage, Eta increases only slightly from .100 to .119.

⁷ Codings for the regression analysis are as follows: *education* (1: low (Hauptschule); 2: middle (Realschule); 3: high (Abitur+); *age* (1: - 19 years; 2: 20 - 24 years; 3: 25 -29 years; 4: 30 - 34 years; 5: 35 - 39 years; 6: 40 - 44 years; 7: 45 - 49 years; 8: 50 - 54 years; 9: 55 -59 years; 10: 60 - 64 years; 11: 65 - 69 years; 12: 70 years +); *children under 14* (0: no child under 14 in the household; 1: 1 child or more under 14); *income per month 1994* (DM 250, 750, 1125, 1375, 1750, 2250, 2750, 3250, 3750, 4250, 4750, 5250, 5750); *household size 1994* (number of persons, 1 to 10); *East-West-Germany* (0: East-Germany; 1: West-Germany); *payed price for healthy food* (in DM); *attitude scales on nutrition* (1: strongly disagree to 5: strongly agree).

⁸ There is, of course, no average price for those households who did not buy anything in the healthy food category. For these households the overall average price for healthy goods has been

income, both variables did not prove to be significant, though. Hence, the three variables have been dropped from the regression equation and the model has been reestimated. In order to assess how important the nutritional attitudes are if taken together, the change in explained variance has also been computed for these variables.

Table 4: *A Multivariate Model for the Purchase of Healthy Food; (OLS-Regression; GfK sample 1)*

	Unstandardized regression coefficients	Standardized regression coefficients
<i>Socio-economic Variables</i>		
Education	1.538 (5.48)	.084
Age (birth cohort)	-.586 (-5.39)	-.105
Children under 14	1.552 (2.22)	.040
Income per month	n.s.	
Household Size	n.s.	
East-West-Germany	5.043 (8.03)	.122
Payed Price for healthy food	n.s. ^a	
<i>Nutritional Attitudes</i>		
Healthy food	1.414 (4.24)	.081
Natural food	.821 (2.86)	.052
Fresh food	1.068 (3.74)	.060
Wholesome food	2.755 (8.84)	.151
Intercept	11.410 (7.13)	
ΔR^2 when including nutritional attitudes	.059	
R^2	.088	
Number of Households	4100	

T-Values in parentheses. a: not significant.

In comparison to the bivariate analyses the pattern is very similar. The preference for wholesome food is still the most important predictor if the standardized coefficient is used as the measure of effect strength. Preference for healthy food, natural food, and fresh food also have significant impacts although their effects are clearly weaker in the multivariate

substituted. As each household can be regarded as a price taker, this assumption seems to be fairly reasonable.

case. In comparison to the whole variance explained, the increase in explained variance makes up more than half when the four attitude scales are added to the socio-economic predictor variables. This strong effect of nutritional attitudes is another indication for the notion that purchasing food is neither a spontaneous act nor a simple execution of habits unconnected to beliefs and preferences.

Again we find a fairly strong effect for the distinction between households in East- and West-Germany. Even after controlling for nutritional attitudes and the other socio-economic determinants, the difference in purchasing healthy food between East- and West-Germany is relevant and highly significant.

5. Conclusion

In the preceding analysis a partial model for the purchase of healthy food has been developed and tested. It is a partial model since some important explanatory variables, such as purchase habits, have not yet been included. Therefore, the main focus in evaluating the findings presented should not be on overall variance explained but rather on the pattern of effects. Strong effects of nutritional attitudes on purchase behavior support the conception stated at the outset that buying food is a type of behavior which is characterized by an *intermediate degree of involvement* (Kroeber-Riel 1992: 169). Viewed from another perspective, these findings demonstrate that beliefs and preferences regarding healthy nutrition do not reflect mere wishful thinking or social desirability on the respondents' side without any behavioral consequences. Consumers do not "preach water – to others – and drink wine for themselves" as the famous proverb would suggest. They rather act according to their overt beliefs and preferences.

Which kind of food is chosen appears to depend as well on factors such as socialization and cognitive capabilities. The negative effect of age and the strong impact of the East-West-German dichotomy are both compatible with a socialization hypothesis whereas the estimated influence of education may indicate that purchasing food requires the ability to acquire and process often complex information on nutrition.

Contact

Dieter Ohr
Universität zu Köln
Institut für Angewandte Sozialforschung
Greinstraße 2
50939 Köln
Dieter.Ohr@uni-koeln.de

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Appendix

Table A1: Food Articles in the GfK consumer data set

Ketchup/spicy sauce/ noodle sauce (1)
Mayonnaise/ remoulade/ salad dressing (2)
Canned vegetables/ tomato paste (7)
Milk (8)
Roasted coffee beans (12)
Instant coffee (13)
Salts (14)
Poultry (16)
Frozen food (excluding untreated poultry) (17)
Teas (18)
Cocoa (19)
Alcohols (20)
Fats (22)
Mustard/ horse-radish (23)
Ready-made cakes (24)
Champagne (26)
Apple-cider (27)
Potato products (30)
Ready-made pudding/ ready-made desserts (31)
Beer (33)
Vermouth/ aperitif (34)
Wine/ mulled wine (35)
Fruit juices (36)
Canned sour food/ sauerkraut/ red cabbage (37)
Crispbread (38)
Coffee products (42)
Fine/ready-made/buffet style salads (43)

Sherry/ port (44)
Pudding - / dessert powder (45)
Non-alcoholic drinks with carbonic acid (e.g. energy drinks) (46)
Soft cheese (e.g. mozzarella) (47)
Cream (50)
Canned milk, coffee cream, coffee whitener (51)
Cakes and cookies for autumn and winter (54)
Vinegar (57)
Cookies (64)
Rusk (68)
Dried ready-made meals (i.e. pizza, spaghetti) (71)
Curd and meals of curd (73)
Savory biscuits (74)
Instant ready-made meals (76)
Canned ready-made meals (77)
Yoghurt (78)
Meal (79)
Hard cheese (e.g. Leerdamer, Gouda etc.) (81)
Baking-powder/ vanilla/ leaven (83)
Mineral water (84)
Icecream (86)
Baking mix (for cakes) (87)
Rice (89)
Cereals (90)
Pastas (91)
Complete ready-made meals in package (93)
Cocktail products (e.g. peanuts, chips) (94)

The numbers in parentheses refer to the product group in the GfK data sets.